

MISSOURI CONSERVATIONIST

VOLUME 85, ISSUE 8, AUGUST 2024
SERVING NATURE & YOU



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Sweet coneflower

MISSOURI CONSERVATIONIST



ON THE COVER

Turkey vulture

by DIANNE VAN DIEN

55-250mm lens, f/6.3
1/250 sec, ISO 200

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Inbox



Letters to the Editor

Submissions reflect readers' opinions and may be edited for length and clarity. Email Magazine@mdc.mo.gov or write to us:

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PHOTOGRAPHER FAN
Noppadol
Paothong, thank
you for your
outrageously
beautiful and
breathtaking
photos. Each and
every one has
such spectacular
qualities. I am a
ginormous fan.

Glenda Valentine
Nixa

CHEERS FOR JUNE

Thanks for a particularly beautiful June *Missouri Conservationist*. Reading it always puts me in a good mood. It is one of the things, including the Missouri Department of Conservation as a whole, that makes me proud to live in this state. Keep up the good work.

John Huxhold via email

HERONS

Thanks for an informative and beautiful June issue. I enjoyed learning more about great blue herons [A Good Place to be a Heron; Page 16]. I always love when I see them, whether they are flying, standing stock still, taking off, or hunting. They are captivating creatures!

I appreciated the sidebar regarding some of the other species of herons in Missouri. My family and I have been keeping tabs on a large rookery of mixed species in north St. Louis since 2017, just west of the Contemporary Art Museum on Washington Ave. They fill the trees and fly low between the city streets looking for twigs to bring back to their nests (if parents) and practice flying (if young). This is a vibrant and surprising community of birds, given that the Mississippi River is 3.5 miles east.

For years we would spend our summer nights at dusk in our backyard calling out the names of the birds that flew overhead en route back to their



home — dozens upon dozens of little blue herons, great egrets, and snowy egrets all traveling back from the Mississippi River together. Their numbers seem to have dwindled in the last couple of years, but checking on them recently, I counted about two dozen great egrets and little blues lazing around in the mid-day heat. It's worth checking out.

Sannah Eisenbraun via email

HUNTERS WITH DISABILITIES

I have enjoyed the *Missouri Conservationist* for years and have always been impressed with the wide range of conservation activities you protect and promote, but you knocked it out of the park with the article in the June issue, *More Than the Harvest: Hunters with Disabilities Connect with Nature* [Page 11]. Kristie Hilgedick not only described the many efforts underway to provide individuals with disabilities opportunities to connect with nature, but reminded us all of the joy and healing power of nature. The volunteers who support this effort deserve our respect and admiration as do the hunters who have not given up on their desire to seek this vital connection.

Janet Desnoyer Kearney

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Send a note using our online contact form at mdc.mo.gov/commissioners.

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The Missouri Department of Conservation protects and manages the fish, forest, and wildlife of the state. We facilitate and provide opportunity for all citizens to use, enjoy, and learn about these resources.



Want to see your photos in the *Missouri Conservationist*?

Share your photos on Flickr at
[flickr.com/groups/mdcreaderphotos-2024](https://www.flickr.com/groups/mdcreaderphotos-2024)
or email Readerphoto@mdc.mo.gov.



1 | Father and
son fishing by
Jennifer Lozano,
via website
submission

2 | Buck in velvet
by **Chris Tharp**,
via Flickr

3 | Great
spangled
fritillary by
Chantel Smith,
via Flickr



Want another chance to see your photos in the magazine?

➔ In the December issue, we plan to feature even more great reader photos. Use the submission methods above to send us your best year-round pictures of native Missouri wildlife, flora, natural scenery, and friends and family engaged in outdoor activities. Please include where the photo was taken and what it depicts.



Up Front

✖ The last few weeks, I have been contemplating the past while dreaming about opportunities for the future. This was ever present as I spent a few days last month with my son catching trout at Bennett Spring. It's hard to describe the youthful excitement of a kid catching his first trout and cooking it over a campfire. He and I have spent many days in the outdoors and hope we will share many more. Those few days brought back many memories forged in the outdoors, including at Bennett Spring.

Our strongest emotional connections with a place usually involve the people we enjoyed those places with and the experience we had together. Those emotional connections get even stronger when tied to our olfactory system. One of my favorite smells is burnt gunpowder. It brings back memories of time with friends and family on the range or in the field (see *Home on the Range*, Page 10). For me, slinging a few arrows from the old compound bow is a great way to wash away the stresses of life.

Numerous publications have shown the positive effect of time in nature on mental health. Considering the growing challenges around loneliness and mental health, we need more time in special places with people that can develop into strong emotional connections. I have great appreciation for the many MDC staff, partners, volunteers (see Pages 4 and 22), and wildlife (see Page 17) that are working hard every day so we have safe and healthy ecosystems to enjoy.

Jason Sumners

JASON SUMNERS, DIRECTOR

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The *Missouri Conservationist* (ISSN 0026-6515) is the official monthly publication of the Missouri Department of Conservation, 2901 West Truman Boulevard, Jefferson City, MO (Mailing address: PO Box 180, Jefferson City, MO 65102.) Equal opportunity to participate in and benefit from programs of the Missouri Department of Conservation is available to all individuals without regard to their race, color, religion, national origin, sex, ancestry, age, sexual orientation, veteran status, or disability. Questions should be directed to the Department of Conservation, PO Box 180, Jefferson City, MO 65102, 573-751-4115 (voice) or 800-735-2966 (TTY), or to Chief, Public Civil Rights, Office of Civil Rights, U.S. Department of the Interior, 1849 C Street, NW, Washington, D.C. 20240.

SUBSCRIPTIONS: Visit mdc.mo.gov/conmag, email subscriptions@mdc.mo.gov, or call 573-522-4115, ext. 3856. Free to adult Missouri residents (one per household); out of state \$13 per year; out of country \$19 per year. Notification of address change must include both old and new address (send mailing label) with 60-day notice. Preferred periodical postage paid at Jefferson City, Missouri, and at additional entry offices.

POSTMASTER: Send correspondence to Circulation, PO Box 180, Jefferson City, MO 65102-0180. Phone: 573-522-4115, ext. 3856. Copyright © 2024 by the Conservation Commission of the State of Missouri.

Printed with soy ink



Nature LAB^{at} WORK

by Angie Daly Morfeld

The Missouri Department of Conservation team is diverse and dedicated to conserving, protecting, and improving our fish, forest, and wildlife resources.

Sherri Russell, DVM STATE WILDLIFE VETERINARIAN

✳ As the state wildlife veterinarian and chief of the Conservation Health Section, Sherri Russell serves two roles. As the wildlife veterinarian, Russell supports staff biologists in their research projects, provides diagnostic services, and consults on projects and policies that affect wildlife to promote the health of wildlife, aquatic populations, and forests. As section chief, Russell fills an administrative position that allows collaboration with staff engaged in monitoring and integrating information about the health of animals, fish, and forests.

A TYPICAL DAY

Russell says one of the best parts of her job is there is no typical day. Some days are spent in the office answering phone calls and emails from inside and outside the department. Others are spent in the field.

"I go where I am needed and provide direct services to the research teams," Russell said. "Field work is when I have direct time with wildlife or fish."

"I love Missouri and I love animals. I see my work as benefiting the next generations so they know the magic that is Missouri outdoors."



Russell works with MDC biologists at Peck Ranch Conservation Area to tag and monitor elk. Just a typical, non-typical day for the state wildlife veterinarian.

NOTABLE PROJECTS

Russell says she is most proud to be part of the team that is the Missouri Department of Conservation.

"We cannot protect and conserve resources if those resources are not healthy," Russell said. "Therefore, work aimed at scientific understanding of threats and opportunities is crucial to our mission."

Russell says she has consulted on many notable projects, including ones with deer and elk, bear, and a couple involving inserting transmitters to track otters and ducks. She is proud to be involved in the One Health initiative, which integrates ecological health with animal and human health in a model that helps people think about our interconnectedness when making decisions.

HOW YOU CAN HELP

Get outside and appreciate Missouri. The best times in life are spent with family and friends in the natural world. While you're out there, keep habitats healthy for wildlife and keep wildlife wild.

Her Education

- Bachelor's degree, University of Missouri: agriculture
- Doctor of Veterinary Medicine, University of Missouri

In Brief

News and updates from MDC



Western ratsnake



Monarch butterfly

MDC GOES TO THE FAIR

DISCOVER NATURE AT THE MISSOURI STATE FAIR AUG. 8-18

➔ MDC will be at the Missouri State Fair in Sedalia all 11 days, giving you a chance to discover nature in the heart of the fairgrounds.

Visit the Conservation Building from 9 a.m. to 7 p.m. to see live fish and other native animals such as snakes, turtles, and amphibians. See displays and learn about native plants that help butterflies and other important pollinators. Ask MDC staff conservation-related questions, get educational materials, and have fun. Join us Friday, Aug. 9 for Missouri Department of Conservation Day — a full day of fun and excitement sponsored by MDC! For more information, visit mostatefair.com.



LAURA CONLEE AND ANDREW BOND NAMED DEPUTY DIRECTORS

Congratulations to Laura Conlee on being named MDC deputy director of resource management and to Andrew Bond on being named MDC deputy director of business and operations. They join MDC Deputy Director of Engagement Aaron Jeffries in assisting MDC Director Jason Sumners in leading the state's conservation department.

"While these two leadership positions are quite varied in their work and responsibilities, they are both critical to carrying out our conservation mission and executing our strategic priorities as a department," said Sumners. "Laura and Andrew each bring their unique expertise, years of experience, and abilities to adapt to conservation and business challenges on the horizon. We are thrilled to have them on our leadership team!"

Conlee has been with MDC since 2016. She joined the department as a fur-bearer and black bear biologist. She was then named chief of the Terrestrial Section and then chief of the Science Branch before being named deputy director.

As deputy director of resource management, Conlee will direct statewide management and research to conserve Missouri's fish, forest, and wildlife resources by providing executive leadership, direction, and counsel to MDC branch chiefs over Statewide Resource Management, Regional Resource Management, Science, and Protection branches. She will also serve as the Regulations Committee chairperson.

Prior to joining MDC, Conlee was the furbearer and black bear project leader and then assistant director of wildlife for the Massachusetts Division of Fisheries and Wildlife.



Laura Conlee and Andrew Bond join MDC administration as deputy directors under Director Jason Sumners.

Conlee grew up in Roselle, Illinois, and received a bachelor's degree in biology from Northern Illinois University and a master's degree in zoology from Southern Illinois University. She currently lives in Ashland with her husband and two daughters. She enjoys hiking, fishing, hunting, camping, and gardening.

Bond has been with MDC for more than seven years with his most previous position being chief financial officer. Prior to joining MDC, Bond spent more than 20 years working for the Missouri Department of Social Services with his last position being chief financial officer for the MO HealthNet Division, Missouri's Medicaid program.

As deputy director of business and operations, Bond will provide executive leadership, supervisory oversight, and counsel to four branch chiefs and one section chief over Business Services, Human Resources, Information Technology, and Infrastructure Management branches, and the Budget section.

Originally from Port Huron, Michigan, Bond received a bachelor's degree in accounting from Northwood University and is a certified public accountant. He currently lives in Jefferson City.

Ask MDC

Got a Question for Ask MDC?

Send it to AskMDC@mdc.mo.gov or call 573-522-4115, ext. 3848.

Q: I found this at Smithville Lake. Can you tell me what it is?

➔ This is a freshwater drum's pharyngeal teeth. These molar-like teeth are tightly packed together at the back of the fish's mouth. Because these teeth are capable of crushing shells, they were originally considered to be mollusk-eaters, but studies indicate in Missouri they mainly eat other fish, crayfish, and immature aquatic insects. They grub along the bottom, moving rocks with their snout to capture escaping prey. In places where mollusks make up more of this species' diet, they use these shell-crushing teeth to munch on shellfish and crustaceans.



Freshwater drum pharyngeal teeth

These fish are most abundant in the Missouri and Mississippi rivers and larger streams of the prairie region. They like lakes and reservoirs — like Smithville — and are often found at depths of 30 feet or more. For more information about these teeth, visit short.mdc.mo.gov/4L9.

Q: This butterfly was enjoying one of my rattlesnake master plants. Can you help identify it?

➔ This is a male eastern tailed-blue (*Cupido comyntas*).

With less than a 1½ inch wingspan, these small butterflies can be found statewide from April to October.



Eastern tailed-blue butterfly

They are the only blue butterfly with tiny tails on their hind wings. They like open sunny places and sometimes bask with their wings open at a 45-degree angle.

As caterpillars, eastern tailed-blues prefer plants in the pea family, such as sweet clover, alfalfa, and vetch. As adult butterflies, they tend to prefer flowers that are close to the ground, like this rattlesnake master plant. They'll swarm at damp places. For more information, visit short.mdc.mo.gov/4LV.

Q: Can you explain the black belly on this squirrel?

→ Yes, this is a melanistic fox squirrel, according to MDC Scientist Beth Emmerich.

Unlike albinism — in which an animal is all-white — melanism is an increased amount of black or nearly black pigmentation in an organism's skin, feathers, eyes, or hair. Melanism is caused by an excess of pigmentation, rather than a lack of it. "That's an interesting one," Emmerich said, noting that the black coloration is more common on the



Melanistic fox squirrel

squirrels' backs, not their fronts.

She said sometimes a pocket of very melanistic individuals will breed, creating colonies of black squirrels.

"They are common now in the small town where I grew up in central Illinois but were not when I lived there," Emmerich said.

For more information about this interesting phenomenon and what causes it, visit short.mdc.mo.gov/4Ly.



Corporal Zack Barnes

RANDOLPH COUNTY
CONSERVATION AGENT

offers this month's

AGENT ADVICE

August is a great time to prepare for the upcoming fall hunting seasons. There is something for just about every hunter in the coming months — from waterfowl to deer and turkey to dove and small game. If you're a trapper, there's plenty of game for you, too. As you are preparing, be sure and put "buy permits" at the top of your to-do list. Permits are sold online at mdc.mo.gov/buypermits, over the phone at 800-392-4115, through the MO Hunting app, or at vendors located across the state. Buy early and avoid the rush. Be aware of any changes to your season by visiting short.mdc.mo.gov/Zjw. There you will find regulation guides for all Missouri hunting and trapping seasons.

What IS it?

Can you
guess this
month's
natural
wonder?

*The answer is on
Page 8.*





GOOSEBERRY FROZEN YOGURT GELATO

If you have gooseberries that need to be used, but the soaring temperatures make you hesitant to turn on the oven to bake a pie, this is the perfect alternative. Not only will it satisfy your sweet tooth, but it's a cool treat that will beat the heat.

Makes 4 servings

INGREDIENTS:

2 cups gooseberries
1 cup sugar
½ cup water
1 cup plain low-fat yogurt

BRING berries, sugar, and water to a slow boil. Simmer until berries are soft and juices are slightly thickened, 20 to 30 minutes. Using a wooden spoon, press mixture through a fine-mesh strainer into a small metal bowl. Make sure you scrape the pulp from the outside of the strainer into the bowl. The mixture will yield about a cup of rose-colored syrup. Cool by setting bowl into a slightly larger metal bowl filled with ice.

Once mixture has cooled, **STIR** in yogurt until well blended. Taste. The fresh fruit should shine through. Add more sugar if you find the mixture isn't sweet enough. Cover bowl and chill for at least 1 hour. I often leave it overnight in the refrigerator.

POUR into container of your ice cream maker and freeze, according to the manufacturer's instructions for your ice cream maker. Spoon into dishes.



This recipe is from *Cooking Wild in Missouri* by Bernadette Dryden, available for \$16 at most MDC nature centers and online at mdcnatureshop.com.



WHAT IS IT?

NORTHERN MAP TURTLE

Northern map turtles have a brown or olive-brown upper shell with a netlike pattern of fine, squiggly, yellow lines that give the appearance of a road map. They are active from March through October and are often seen basking in the waterways they inhabit. They will bask for as long as eight hours a day in large groups.



REGULATION CHANGES FOR FALL DEER AND TURKEY SEASONS

MDC reminds hunters of regulation changes for the upcoming fall deer and turkey hunting seasons.

Turkey Changes

- Turkey permits will no longer be included with an archer's permit.
- A new fall turkey hunting permit has been created. Both fall firearms turkey hunters and fall archery turkey hunters must purchase this permit to be able to take turkeys during fall.
- The fall turkey season is now divided into archery and firearms portions, and the harvest limit has been reduced from four to two birds of either sex (both portions combined).

CWD Updates

- Audrain, Boone, Cole, Dent, Douglas, Howard, Lewis, Maries, Monroe, Newton, Osage, Phelps, Randolph, Saline, Scotland, Shannon, Shelby, and Webster counties have been added to the Chronic Wasting Disease (CWD) Management Zone.
- As with all counties in the CWD Management Zone, grain, salt products, minerals, and other consumable products used to attract deer are prohibited year-round. Hunters must also follow carcass transportation regulations. All counties in the CWD Management Zone are open during the CWD portion of firearms deer season.
- Hunters who harvest a deer from Nov. 16–17 in designated CWD Management Zone counties must take the deer (or its head) on the day of harvest to a mandatory CWD sampling station.

Other Updates

- The antler-point restriction has been removed from Audrain, Boone, Cole, Howard, Lewis, Maries, Monroe, Osage, Phelps, Randolph, Saline, Scotland, and Shelby counties.
- Deer hunters may now fill four firearms antlerless permits in Dent, Douglas, Maries, Newton, and Phelps counties.
- Hunters may now use archery antlerless permits in Dunklin, Mississippi, New Madrid, and Pemiscot counties.
- New managed deer hunts have been added and others have been removed or modified.
- Deer hunting regulations have changed for some conservation areas.
- Hunters may now use aerial drones to track wounded deer and turkeys.
- Prices for deer and turkey hunting permits have increased.

Get more information from MDC's *2024 Fall Deer & Turkey Hunting Regulations and Information* booklet, available where permits are sold and online at mdc.mo.gov.



NEW MDC HUNTING BOOKLETS AVAILABLE

Missouri deer, turkey, waterfowl, and dove hunters can get the most current information on upcoming fall hunting from MDC's new *2024 Fall Deer & Turkey Hunting Regulations and Information* booklet and the *Migratory Bird and Waterfowl Hunting Digest 2024–2025*.



The *2024 Fall Deer & Turkey Hunting Regulations and Information* booklet has detailed information on fall deer and turkey hunting seasons, limits, permits, managed hunts, regulations, conservation areas to hunt, post-harvest instructions, chronic wasting disease (CWD) updates, and more. The booklet is available where permits are sold and online at mdc.mo.gov.


The *Migratory Bird and Waterfowl Hunting Digest 2024–2025* has detailed information on waterfowl hunting along with hunting doves and other migratory game birds such as rail, snipe, and woodcock. It also has information on needed permits and duck stamp requirements, hunting seasons and limits, hunting areas, regulations, and more. The digest is available where permits are sold and online at mdc.mo.gov.

Buy Missouri hunting and fishing permits from numerous vendors around the state, online at mdc.mo.gov/permits, or through MDC's free mobile app, *MO Hunting*, available for download through Google Play or the App Store.





MDC Outdoor Education Center
Specialist Noah Brocato assists range
visitor Pat Conley during target practice.



A school group works on archery techniques at the Andy Dalton Shooting Range near Springfield.

HOME ON THE RANGE

MDC SHOOTING RANGES, CLASSES OFFER OPPORTUNITIES FOR NEW AND EXPERIENCED SHOOTING SPORTS ENTHUSIASTS

**by Noah Brocato
photographs by David Stonner**

With fall hunting seasons on the horizon, August is a great time to begin preparing your favorite firearms and archery equipment to be at peak performance in the field. Each year the National Shooting Sports Foundation celebrates National Shooting Sports Month in August, a time to recognize shooting sports' positive influence on wildlife conservation and the contribution that shooting sports enthusiasts make to the economy. Missourians have a wide variety of public shooting ranges at their disposal across the state.

STAFFED RANGES

MDC has two different types of shooting ranges — staffed and unstaffed. MDC has six staffed shooting ranges:

- Andy Dalton Shooting Range and Outdoor Education Center (Greene County)
- August A. Busch Shooting Range and Outdoor Education Center (St. Charles County)
- Jay Henges Shooting Range and Outdoor Education Center (St. Louis County)
- Lake City Shooting Range and Outdoor Education Center (Jackson County)
- Parma Woods Shooting Range and Outdoor Education Center (Platte County)
- Rocky Fork Lakes Shooting Range (Boone County)

These ranges are open year-round and offer a variety of shooting opportunities for rifle, pistol, shotgun, and archery. MDC staff members and volunteers are on-site to facilitate a safe shooting environment as well as aid shooters. Each year around 80,000 people visit these ranges to practice their marksmanship skills, prepare for hunting seasons, introduce new people to the shooting sports, and enjoy time with friends and family.

"I remember going out to shoot when I was 13 or 14 with my dad," said Pat Conley, a frequent user of Jay Henges Shooting Range. "But soon, like many people, a working life took up all my time. When I retired at 70, I thought it would be nice to return to my youth and came out to Henges to shoot a .22 rifle just for fun. Soon, that trip to the range became my form of therapy. This past year, I had some serious surgery, and recovering from it and the grueling physical therapy really wore me out. But going to the range and honing my skills — becoming more accurate at greater distances and with several different types of firearms — gave me something to look forward to throughout the process."



“The controlled environments of the MDC ranges ensure a safe and enjoyable experience to come and practice shooting skills. Nothing beats busting a few clay birds or hitting the bull’s-eye over and over again.”

PAT CONLEY





Conley's story is one to which many can relate. Shooting sports are truly an activity that can be enjoyed by all, and there are countless opportunities around the state to get out and enjoy them.

"The controlled environments of the MDC ranges ensure a safe and enjoyable experience to come and practice shooting skills," said Conley. "Nothing beats busting a few clay birds or hitting the bull's-eye over and over again."

Staffed shooting ranges are a great place to enjoy recreational shooting and introduce new shooters to a lifelong hobby, but they also serve as a place where hunters prepare for the seasons ahead of them.

For wing shooters, a great form of practice for the field is the sporting clays game five-stand. Five-stand takes the different presentations found on a sporting clays course, but is all held in one spot, like the layout of a trap field. The target presentations are designed to mimic different hunting scenarios that a wing shooter may find themselves in, from decoying mallards and incoming doves, flushing quail and pheasants, and even rabbit targets. Taking the time to practice some of these scenarios in the summer will lead to more success in the fall. The six MDC staffed shooting ranges offer five-stand shooting, so contact the range closest to you for more information. If a staffed range is out of your zone, there are many sporting clays ranges around the state that will have something to meet your wing shooting needs.

UNSTAFFED RANGES

While the staffed shooting ranges are a great asset for honing your marksmanship skills and preparing for hunting seasons, there are dozens of unstaffed shooting ranges across the state that offer tremendous shooting opportunities — some closer to home than you might realize.

The key to a fun and enjoyable day on the range is to be mindful of firearm safety. Regardless of staffed or unstaffed, it is important to remember these four fundamental rules of firearm safety:

1. Keep the muzzle pointed in a safe direction at all times.
2. Keep your finger off the trigger until you are ready to shoot.
3. Keep your safety on until you are ready to shoot.
4. Be 100 percent certain of your target and what is beyond it before firing.

Along with these key safety fundamentals, there are some other safety tips that will help you and others get the most out of a day of shooting. Always wear eye and ear protection when you are on or near the firing line. Clean up after yourself or your group, and only use paper targets on the provided target stands. When holding a ceasefire, never handle a firearm while people are downrange of the firing line. Following these guidelines will ensure everyone can enjoy their time on the range.

If you're looking to test your long-range shooting skills, Apple Creek Conservation Area (CA) in Cape Girardeau County or Gallatin CA in Daviess County offer ranges stretching over 200 yards. If you want to dial your scope in at a closer distance or even put some rounds through your favorite handgun, there are countless ranges throughout the state that can accommodate both rifle and pistol shooting in the same trip, such as Whetstone Creek CA in Callaway County.

Maybe a shotgun suits you better. Try unstaffed ranges like Deer Ridge CA in Lewis County for a day of breaking clay targets or Gist Ranch CA in Texas County to pattern your shotgun for turkey and waterfowl season.

For those that enjoy archery, what better way to spend a summer day than on a 3D archery course. Several 3D and static ranges can be found across the state, including the August A. Busch Archery Complex in St. Charles County, Reed Memorial CA in Jackson County, and the Grundy Memorial Wildlife Area in Douglas County.

No matter your sport or what portion of the state you call home, you likely have a shooting range in your area. To find a shooting range near you, visit short.mdc.mo.gov/4uJ.

COMPETITIVE SHOOTING

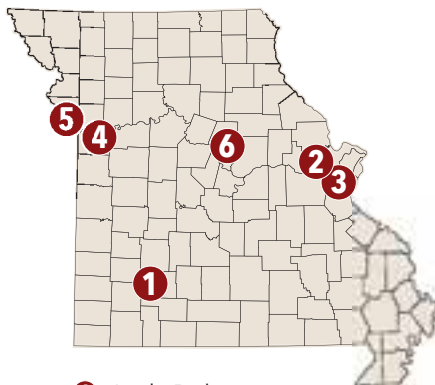
Shooting sports are a great pastime for people looking to enjoy a nice summer day, but for those shooters that want to dive deeper into their favorite shooting sport, competitive shooting may be the next step.

The opportunities for competition are endless — from 3D archery tournaments, sporting clays competitions, and even cowboy-action shooting competitions where participants dress in their favorite western attire to compete. There really is something for everyone. Joining a league at your local gun club is a great way to meet other shooters and shoot in a semi-competitive and friendly environment. Another way to get involved with competitive shooting sports is to attend competitions that are fundraisers for local charities or other organizations. These types of events take place almost year-round for shotgun sports, 3D archery, and many other disciplines. These shoots have the competitive aspect of trying to shoot well and take home either money or a trophy, but the overall atmosphere surrounding the day is very inviting and enjoyable.



On a larger scale, many shooting sports disciplines have their own governing bodies on both a state and national level that handle memberships and coordinate different shoots. For example, the Amateur Trapshooting Association is the governing body for the entire country, while the Missouri Trapshooters Association (MTA) handles things on a state level. The MTA, located at Linn Creek in Camden County, is home to the second largest trapshooting facility in the country and even hosted the 2020 Grand American Trapshoot, the largest trapshooting event of the year.

Other governing bodies include the National Skeet Shooting Association and National Sporting Clays Association, Archery Shooters Association (3D archery), and USA Archery (indoor archery). In recent years, a new discipline of shooting sports has come onto the scene with 3-gun competitions. Organized mainly by the United States Practical Shooting Association, this sport is a combination of rifle, pistol, and shotgun shooting. Shooters will move through stages that require the use of the different firearms in a specified combination, gaining points for the speed and accuracy for which they complete the stage. Whether you're a weekend warrior or wanting to take your hobby to the next level, there really is something for everyone.



- ❶ Andy Dalton
- ❷ August A. Busch
- ❸ Jay Henges
- ❹ Lake City
- ❺ Parma Woods
- ❻ Rocky Fork Lakes

“The MDC programs have made such a huge impact on my lifestyle — it introduced me to the great outdoors. Coming from the inner city, I would’ve never thought a person like me would be out hunting, shooting clay targets, even just hiking in the wilderness.”

DERRELL BRISBY

CLASSROOM WORK ON THE RANGE

MDC staffed shooting ranges and education centers offer free educational programs to the public. These programs range from typical introductory courses, to how to start shooting archery or handguns, to more involved classes covering topics such as reloading your own ammunition. In addition, these facilities also offer free hunter education certification.

These programs allow participants to learn new skills and refine current ones, which is exactly what attracted the Brisby family. Derrell and Jasmine Brisby have attended several hunting clinics and shooting sports classes over the years, introducing lifelong skills the couple never thought possible.

“The MDC programs have made such a huge impact on my lifestyle — it introduced me to the great outdoors,” said Derrell. “Coming from the inner city, I would’ve never thought a person like me would be out hunting, shooting clay targets, even just hiking in the wilderness.

“I first learned about MDC from a gun shop but was never told what exactly was offered. I discovered the registration online and was blown away that there was no charge whatsoever. Not only did this help get me outdoors more, but it gave me something new and exciting to do with my wife and has even provided some great content for my YouTube channel. Since then, I’ve been advocating for more folks like me to take advantage of the resources that’s available through the MDC programs.”

Even though Jasmine had some knowledge on firearms prior to attending these classes, she says the hands-on experience makes the difference.

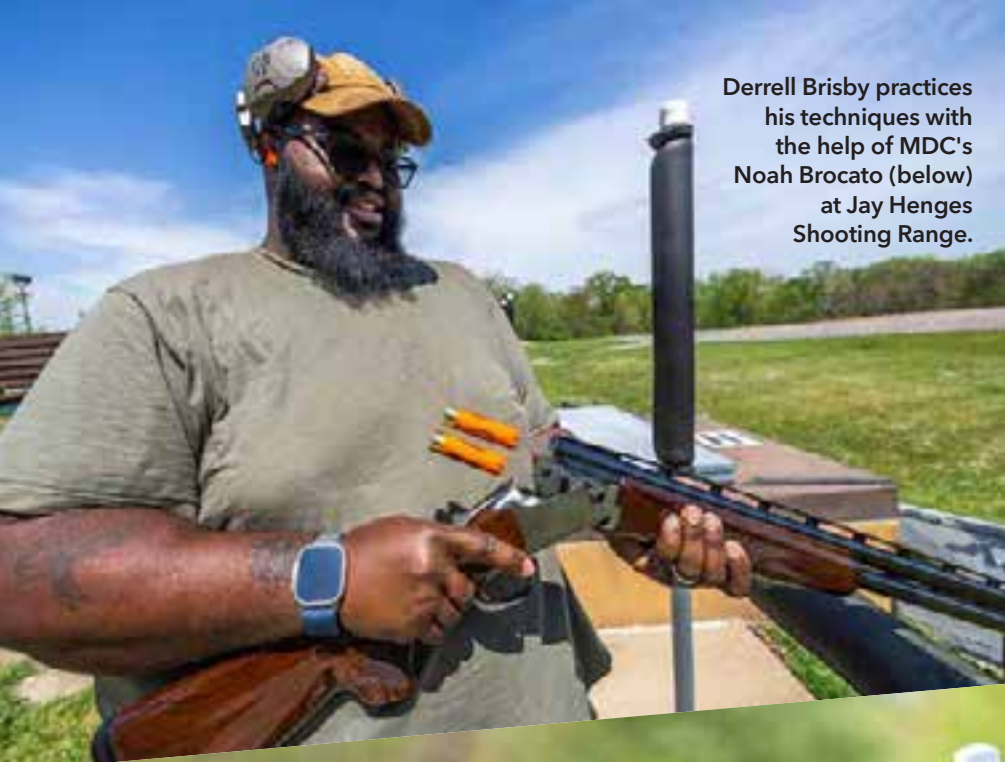
“Attending these classes helped me better understand and become confident with the fundamentals of shooting,” said Jasmine. “Safety is always the main priority in all the classes we’ve taken, but there’s many basics covered from understanding the correct way to hold a firearm, using the sights correctly, and many more. You can never have too much training and I get to learn about different firearms in a controlled environment.”

Opportunities to learn new skills in the hunting and shooting sports realm are plentiful, and many are closer than you think.

“It blew my mind to learn how many of these programs were in locations familiar to me, but I had never paid attention,” said Derrell. “I never felt out of place when attending the programs especially since most of the time my wife and I were the only black people in the program. All the instructors and volunteers are very friendly and helpful. They have been very patient with me and make sure to take their time until I understand what it is they’re trying to teach.”

To find events in your area, go to mdc.mo.gov/events and filter down to your county or a specific facility. ▲

Noah Brocato is an outdoor education center specialist at MDC’s Jay Henges Shooting Range in Eureka. In his spare time, he enjoys shooting sporting clays and fly-fishing.



Derrell Brisby practices his techniques with the help of MDC's Noah Brocato (below) at Jay Henges Shooting Range.



A bowhunter collects his arrows from a target at the Little Black Conservation Area archery range in Ripley County.



Jasmine Brisby goes bowfishing after gaining confidence from the outdoor skills courses she's taken from MDC.

FUNDING THE FUTURE OF CONSERVATION

In the fall of 1937, President Franklin D. Roosevelt signed into law the Wildlife Restoration Act of 1937, or, as it's better known, the Pittman-Robertson Act. Named after the act's two main sponsors, Key Pittman and A. Willis Robertson, the act takes an excise tax (paid for by the manufacturers) on firearms, ammunition, and archery equipment sales and directs it back to state fish and game agencies in the form of grants. These grants are distributed out annually and are used to fund a variety of programs each year. These include, but are not limited to, habitat management and research projects, hunter education, public shooting ranges, and other "R3" efforts — or recruitment, retention, and reactivation of hunters and target shooters. In Fiscal Year 2023, the Pittman-Robertson Act broke its annual record with \$1.2 billion generated from the program nationwide. When we enjoy shooting sports, wildlife wins. And when wildlife wins, we all win.

BEYOND THE 'UGLY'

FAMILIARITY MAY CHANGE HOW
YOU VIEW VULTURES

by **Dianne Van Dien**



SOARING AND CLOSEUP TURKEY VULTURES: DIANNE VAN DIEN; PERCHED
TURKEY VULTURE (LEFT) AND BLACK VULTURE (RIGHT): JIM RATHERT



“I know we need vultures, but, wow, they’re just so ugly!” a jogger told me one morning while I was watching a group of turkey vultures in a park. She stopped just long enough to make this statement, and then kept running.

Vultures, it seems, often evoke a reaction in people. During the many hours I’ve spent observing these birds, dozens of people have approached me to voice their opinion. A few have expressed admiration. Most, however, convey that they’re fine with vultures dining out there on dead animals, but the key is that vultures remain “out there.” Up close, these large birds with bald heads and “gross” eating habits tend to make people uneasy.

In Missouri we have two species of vultures — turkey vultures and black vultures. Turkey vultures are found throughout the state from March through October but only in southern portions in winter. Black vultures are found mainly in southern Missouri, but their range is expanding northward.

Most often you will see vultures soaring high above you or eating road-kill. But as these species are adapting well to life among humans, you may also find them roosting in your neighborhood, perching on a local billboard, or picking through trash in a dumpster.

Getting to know more about them — not just how they eat but how they live their day-to-day lives — may alleviate your discomfort and help you see beyond the “ugly.”

Turkey vulture

Vulture Cam

Although vultures are dedicated parents, neither of our two vulture species build nests. They lay their eggs on a bare surface inside hollow trees and caves, next to logs, under bushes, or under limestone overhangs. They also nest in human-built structures.

Every year, MDC Natural History Biologist Rhonda Rimer checks old barns and other buildings for barn owl nests, but sometimes she finds vultures, too.

“It’s fascinating how many species one crummy old structure can support,” she says. “I’ve found big brown bat roosts and barn owls on a higher level, and turkey vultures or black vultures nesting under the floorboards or in the crawl space.”

Over years of vulture nest encounters, Rimer has grown more and more interested in vultures. Turkey vultures nesting in the barn of Chuck Hird in Marshall, Missouri, sparked his interest in vultures as well. The vultures began nesting in the barn’s loft in 2009 and kept returning each year. When Hird contacted the Raptor Resource Project (based in Decorah, Iowa) about the nest, the staff jumped at the chance to add a turkey vulture nest cam to their existing cams on eagles, falcons, and other raptors. Turkey vultures usually nest in secluded places, so a nest where electricity could be brought in to run a livestreaming camera was a grand opportunity. In 2012, the vultures in Hird’s barn

became the first nesting turkey vultures to ever be livestreamed. People in countries around the world began watching them.

“It’s impressive to me how much both parents take part in raising the chicks,”

Hird says. Both parents incubate the eggs and feed the young after they hatch. Turkey vultures usually lay eggs from early April through early May. (Black vultures lay eggs a month earlier.) Two eggs are the norm. They hatch in about a month.

For the first week after hatch, the parents take turns brooding the chicks to keep them warm, but once the nestlings can regulate their own body heat, both parents are gone most of the time, searching for food, returning for brief intervals to regurgitate a meal into the chicks’ mouths.

Hird and his wife, Marty, say that if the nest cam is on and they’re in another room, they still know when there’s been a feeding. “You’ll hear the formidable squawking and carrying on,” says Hird, “as they [the chicks] almost attack whatever parent has the food.”



Left: Turkey vulture chicks gradually lose their down as feathers grow in.

Below: A recently fledged turkey vulture plays with a stick.



Vultures lack the vocal structure required to sing or make typical bird calls; they can only grunt and hiss.

“The sound that comes out of the young ones’ mouths is very scary,” says Rimer. “They spread their wings open and try to look so menacing, but at the same time they’re just fluffy, little powder puffs.”

The chicks gradually lose their fluffy down as feathers grow in. Over time, the youngsters begin to explore their surroundings. As they approach full size, they practice opening their wings and jump around while flapping. In just over two months, they are ready to leave the nest and learn the art of soaring.

Riding on Air Currents

“Because their food source is unpredictable and they may spend hours searching for a carcass,” MDC State Ornithologist Kristen Heath-Acre explains, “vultures are designed to cover lots of ground and do so in a way that conserves energy. Their bodies are light compared to how long their wings are, and aerodynamically that means they don’t have to flap much.”

Flapping burns a lot of energy, so vultures soar. To gain altitude, vultures float on thermal updrafts (rising columns of warm air) that carry them skyward. They circle upwards until they reach a good height, then they glide off in their chosen direction, gradually losing altitude, but then they find another updraft and repeat the process.

Although both species rely on soaring, there are differences in how they fly.

“Black vultures have a heavier wing load and so they flap more than turkey vultures,” says Heath-Acre. “Turkey



Black vulture

vultures don't flap very often, and they tilt back and forth when they soar."

Both species weigh an average of 4 pounds, but while black vultures have a 5-foot wingspan, turkey vultures' wings span 6 feet. With a lighter wing load, turkey vultures can travel on weaker air currents than black vultures can.

Adult turkey vulture

Identifying features:

- Red head and white beak
- Lower half of wing is silvery white when viewed from below



Juvenile turkey vulture

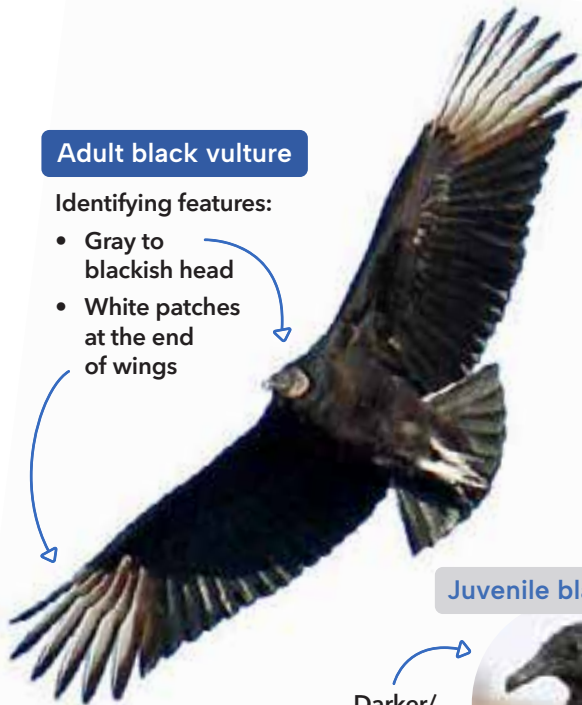
Gray head



Adult black vulture

Identifying features:

- Gray to blackish head
- White patches at the end of wings



Juvenile black vulture

Darker/blackish head



Vultures Slow the Spread of Diseases

Ecologically speaking, the job of vultures is scavenging (eating dead animals). While many animals scavenge some of the time (for example, coyotes, eagles, raccoons, opossums, and bears), only vultures are equipped to scavenge full time. Being a great scavenger may not sound like something to brag about, but the scavenging role of vultures makes a huge contribution to our ecosystem.

Vultures help curb the spread of diseases by removing carcasses swiftly. Because vultures travel by air, they can cover more ground and find carrion faster than mammalian scavengers, which move on foot and must navigate around bushes, hills, and other obstacles.

"Once vultures locate a carcass, they gather in large numbers and consume it quickly," MDC Wildlife Health Program Supervisor Deb Hudman explains. "This rapid removal of carcasses prevents the buildup of rotting flesh, which can harbor bacteria, parasites, and other disease-causing organisms."

"Vultures also have a highly efficient microbiome," she says. The bacteria and other microbes that live on a vulture's face and in its stomach allow it to safely consume many pathogens that would sicken other animals.

So, when a vulture is the first to find a carcass, diseases the dead animal may carry (such as distemper, tularemia, and rabies) are taken out of the environment. However, if a raccoon, opossum, or your dog were to eat that same carcass, they could get sick and potentially spread the disease to others. By outcompeting other scavengers, vultures stop this disease cycle, protecting not only wild animals, but also pets, livestock, and humans, because many wildlife diseases can cross over to us.

Learn more about vultures' adaptations for scavenging online at short.mdc.mo.gov/4eC.



Human-Vulture Conflict

Sometimes vultures can cause problems for people. Both species may roost in large numbers in trees in a yard or neighborhood. During migration, they likely will stay for only a week or two, but if they use your neighborhood as a summer or winter roost, the accumulation of droppings can get smelly. Likewise, if they perch regularly on cell phone towers, the buildup of feces can be problematic for technicians who climb the towers. Black vultures sometimes cause property damage by tearing windshield wipers on cars, awnings and seat covers on boats, or shingles on rooftops. Black vultures are also known to occasionally prey on newborn livestock.

"We'll work with landowners to prevent as much conflict as possible," says MDC Wildlife Management Coordinator Alan Leary. Because the black vulture population is increasing, agencies in Missouri are developing "an integrated wildlife damage management approach that involves deterrence, harassment, possibly some lethal control, and modification of human behavior," he says.

Vultures are federally protected, and it is illegal to harm or kill them without a permit. However, there are things you can do to make your property less inviting to them. For information on how to deter vultures or how to get a depredation permit, contact your local MDC wildlife damage biologist.

Additional information is available on the MU Black Vulture Project (short.mdc.mo.gov/4ey) or USDA Animal and Plant Health Inspection Service Operational Activities: Vultures (short.mdc.mo.gov/4uT) websites.

Food and Community

Vultures' daily lives revolve around searching for food and gathering each evening at a communal roost. Black vultures and turkey vultures both roost in groups ranging from a few individuals to hundreds. In areas where the species overlap, the two may roost together.

On a typical day, vultures leave their roost trees around sunrise and move to an open spot nearby where they can warm up in the sun. Often, they'll perch in dead trees with no leaves, but the shore of a lake, the sunny side of a dam, top of a billboard, or cell phone tower also make great spots for sunning. They then spend the next one to three hours preening their feathers as they wait for the sun's rays to heat the ground and create the updrafts they need to head out and search for food.

Vultures don't reach breeding age until they are 6 or 7 years old, so during the nesting season, nonbreeding vultures are what you'll find at roosting sites. But after the young have fledged, parents and their offspring begin joining the roosts. In Missouri, this typically happens in July for black vultures and August for turkey vultures.

Vulture Behavior

Although both species will roost in large numbers, black vultures are considered more social, with long-lasting family bonds. Turkey vulture families haven't been studied much, but it appears that after the young fledge, parents care for them for only a few weeks. Black vultures, however, feed their young for up to six months after fledging. Black vultures also help their offspring feed at crowded carcasses by pushing unrelated vultures away.

Turkey vultures have a superior sense of smell, which helps them find carrion more quickly. Black vultures seem to know



Left: Turkey vultures dine on a carp that washed ashore.

Below: Black vultures pick at a carcass.





this and fly higher in the sky, watching turkey vultures as they forage. When a turkey vulture lands, the black vultures follow it to the carcass. Because black vultures feed in larger groups, they usually outnumber the turkey vultures and take over the meal. This may be why turkey vultures tend to feed on smaller carrion — they can eat it quickly before black vultures, an eagle, or other large predator takes it away.

Vultures and People

Not all animals adapt well to living alongside humans, but black and turkey vultures have. The human-developed landscape offers many features they need as more remote habitat disappears. Not only do our old buildings provide nesting sites, but roofs and cell phone towers make good perching areas, and dams and fragmented forest edges create updrafts when wind hits them. And, of course, our cars and roadways offer a never-ending source of carrion.

While vultures sometimes damage property, the overall effect of having them around is beneficial. By eating carrion, vultures slow the spread of diseases and help regulate populations of mammalian scavengers.

“About 60 percent of the world’s vultures are listed as endangered or threatened. We’re really lucky that our two species are doing very well,” says Rimer.

In India, three vulture species declined by 96 to 99 percent in the 1990s. Vultures had been key in reducing the spread of rabies and other diseases that affect both humans and animals. The steep decline in the vulture population led to an increase in these diseases, costing the Indian government billions of dollars in healthcare. Although the cause of the decline has been identified and changes are underway — including the release of captive-reared vultures — restoring the population takes time. Until the numbers rebound, the people of India are keenly aware of this loss.

Vulture Appreciation

The loss of vultures in several parts of the world prompted conservationists globally to launch International Vulture Awareness Day (IVAD) in 2009. Through IVAD events and other education campaigns, people at large are beginning to appreciate the importance of vultures. More researchers are also studying vultures, including our two species. People who work with vultures often report that the more they learn about vultures, the more they like them.



Vultures often perch in open areas or dead trees to warm up in the morning sun.

Ivan Vining has volunteered at the Raptor Rehabilitation Project in Columbia, Missouri, for six years, caring for injured birds of prey. He’s worked with owls, hawks, falcons, and eagles, but vultures are by far his favorite.

“Vultures are awesome!” Vining says. “They are so efficient at doing their job... and integral to keeping our environment clean.” ▲

Dianne Van Dien is a publication editor for MDC and writes Nature Lab for Missouri Conservationist. She researched and wrote about turkey vultures for her master’s project in 2012 and has been observing vultures ever since.





85 YEARS OF PROTECTING
MISSOURI'S WATER RESOURCES

by Rebecca O'Hearn and Matt Combes


INVESTIGATING POLLUTION AND FISH KILLS

HEALTHY FISH, FORESTS, WILDLIFE,

and people are dependent on clean water. Missouri has a history of investigating fish kills and pollution-related events in our water resources that pre-dates MDC's formation in 1937.

In fact, Missouri's first water pollution law, Contamination of Streams—Misdemeanor, was on the books before 1909. The law stated, "It shall be unlawful for any person to cause any deleterious substance to be placed, run, or drained into any of the waters of this state in quantities sufficient to injure, stupefy, or kill fish, which may inhabit the same at or below the point where any substance was thrown, run, or drained into such waters; provided that it shall not be a violation of this section for any person engaged in industry, to cause or permit any water subject to his control or used in any branch of such industry to be so discharged under such precautionary measures as have been specifically approved by the commission. Any person violating any of the provisions of this section shall be deemed guilty of a misdemeanor."

This statute became part of the *Wildlife Code of Missouri* in 1939 after MDC was created. This and other early legislative attempts to protect water resources were driven by disease epidemics spread through water or impacts to livelihoods when water polluted by one person prevented economic success by another. Wherever you lived in Missouri, there was a good chance you would be affected by your upstream neighbor, or you may unknowingly be impacting your neighbors downstream. However, cases tried under the early statutes usually weren't won in court because the regulation just didn't have any teeth.

A photograph showing several dead gizzard shad fish floating in a pond. The fish are silvery with a dark stripe along their sides. They are surrounded by dense, tall grasses and some fallen leaves. The water is dark and still. The scene is likely a natural habitat, possibly a marsh or a small pond, during a seasonal event like spring ice melt.

Dead fish, like these gizzard shad, accumulate under ice in lakes and ponds throughout winter and float to shore after the ice melts in spring. This recurring annual event usually isn't caused by pollution.

WATER HEALTH: A TOP PRIORITY

Clean water was a top priority for MDC. Water pollution reduced the amount of fish that could be produced in Missouri's waters, and fish from some locations weren't safe for people to eat. The Conservation Commission hired Paul G. Barnikol in 1939 to study the effects of water pollution on Missouri's fisheries. Barnikol was the first fisheries graduate from University of Missouri and the third fisheries biologist hired by the commission.

Regional surveys to document the effects of pollution on fisheries in Missouri started in 1945, and then conservation agents began a yearly statewide survey of pollution in 1949. In the early days of the Water Pollution Program, many of the same issues we face today — like sewage effluents, packing plant wastes, hydropower generation, and industrial plant

discharges — were causing fish kills. However, pollutants were more widespread then, and there were far fewer staff available to focus on cleaning up pollution. Past pollution had resulted in conditions that poisoned Missouri's aquatic life and made fishing and recreating on Missouri waters unappealing at best, and impossible at worst, in some areas of the state. Coal mining drainage was a big problem at that time. Historic files also show that the new chemical age in agriculture was affecting fisheries in the late 1940s and early 1950s through unintended consequences of herbicides, pesticides, and fertilizers running off fields into streams.

EDUCATION AND OUTREACH

MDC outreach at the time educated the public on the gravity of the pollution issue and promoted the need for better state and federal regulations. An excerpt from an April 1950 *Missouri Conservationist* article by Herbert J. Fisher noted, "One of the gravest problems confronting [us] is stream pollution ... It is not a crisis lying in the future to be faced at a later date; it is not a menace which faces some distant group of people. It is right here, in Missouri, a threat to health, beauty and all aquatic life."

The article was written two years after the enactment of the Federal Water Pollution Control Act in 1948. This federal law helped with construction of municipal waste treatment plants but left much to be desired for protecting water quality and aquatic biota. Staff in the Water Pollution Program worked closely with the Conservation Federation of Missouri and helped pass the Water Pollution Control Act in the Missouri Legislature in 1957. This was a big deal for clean water. It created a Water Pollution Control Board and established a permitting system for new and modified pollution discharges. After the law was implemented, water quality improvements were observed in the statewide pollution surveys conducted by conservation agents.



Release of chlorinated water to empty backyard pools is often the cause of fish kills in urban settings. If you live near a stream, treat your pool with dechlorinating chemicals before emptying it or direct the water to the sewage system.

PAST POLLUTION POISONED MISSOURI'S AQUATIC LIFE AND MADE FISHING AND RECREATING ON MISSOURI WATERS UNAPPEALING AT BEST, AND IMPOSSIBLE AT WORST.



MORE LAWS, CLEANER WATER

State and federal legislatures continued to evaluate and improve the Water Pollution Control Act during the 1960s, and MDC created a Water Quality Branch to better respond to the improvements in the act. Staff in the branch worked closely with the Clean Water Commission to inventory pollution in Missouri and its effects on aquatic biota.

Under the improved Federal Water Pollution Control Act, water quality standards were needed for streams crossing state borders. The newly formed Water Quality Branch worked to propose water quality standards for the state that were protective of aquatic life, some of which are still in state code today.

In the early 1970s, the Federal Water Pollution Control Act was again reorganized and expanded with significant changes. The expanded act became known as the Federal Clean Water Act in 1972. The Environmental Protection Agency was created to implement the improvements and the new law had aggressive goals: “zero discharge of pollutants into navigable waters by 1985 and fishable and swimmable waters by 1983.”

To comply with the new federal regulations, the Clean Water Commission began to establish water quality standards for different classes of water bodies based upon designated uses defined in the Clean Water Act. Language was included in Missouri code that made it illegal to discharge harmful contaminants



Top: Pollutants that cause fish kills can leave a visible sheen on the surface of the water. DNR’s Environmental Emergency Response Unit often supervises the cleanup of polluted waters.

Above: Harmful algal blooms (HAB) often turn waterbodies green. HABs rarely kill fish but can be harmful to wild animals, livestock, pets, and people. Don’t touch water that looks like this and keep pets away.

into waters of the state, degrade water quality below established standards, or exceed effluent limitations established in a permit. The new Clean Water law was far superior to the pre-1909 law in the *Wildlife Code*. There was still no Missouri Department of Natural Resources (DNR) in 1972, so MDC, the Clean Water Commission, the Attorney General’s office, and prosecuting attorneys coordinated the enforcement of the new water pollution laws. The Clean Water Commission wanted to adopt MDC’s methods of collecting evidence about fish kills to enforce the new law.

FISH KILLS AND POLLUTION

Fish kills are categorized into four different types based on their pollution-related causes: municipal, agricultural, industrial, or transportation pollution. Reliable computerized records on fish kill investigations started in about 1988. These records demonstrate a spike in the number of fish kills in the 1990s, decline through the early 2000s, and remaining near 30 events per year for the past 20 years.

In the early 1990s, industrial pollution sources were often the leading cause of fish kills, but in recent years municipal pollution has been the leading cause of events, followed by agricultural pollutants. Sewage and chlorinated water releases are the most frequent sources of municipal pollution that kills fish.

When fish kills and pollution were part of the *Wildlife Code*, MDC worked closely with the American Fisheries Society's Pollution Committee to develop scientifically sound and defensible methods to collect chemical and biological evidence linking pollutants to fish kills, quantify the dead organisms, and calculate monetary values for the event. The American Fisheries Society is a nongovernmental, professional organization established in 1870 and dedicated to strengthening the fisheries profession, advancing fisheries science, and conserving fisheries resources.

At first, values of fish were obtained from the commercial fishing industry, but this limited cases to harvested species. Also, it only accounted for market value, not the costs of producing the fish, known as replacement value. Hatchery production costs were added to include more species, but many fish species are neither harvested nor produced in hatcheries.

Newer methods provide values for all fish species in Missouri, with prices ranging from \$0.20 per minnow to \$3,000 per paddlefish. MDC also assesses values for

other animals killed during pollution events, such as amphibians, birds, mussels, crayfish, other macroinvertebrates, and mammals.

The American Fisheries Society expanded damage calculation methods to include a recovery time element for biological injuries called interim loss. Interim loss accounts for biological losses for the duration of the recovery period following a pollution-related incident. For example, if left to recover unassisted, a trophy-size largemouth bass killed during an incident would not be replaced by a new trophy-size bass for several years. There are biological losses to the system until largemouth bass of trophy-size return to the affected water body. MDC began calculating interim loss for events that killed multiple memorable or trophy-size fish and for events that damaged systems so badly that they would not recover for several years.

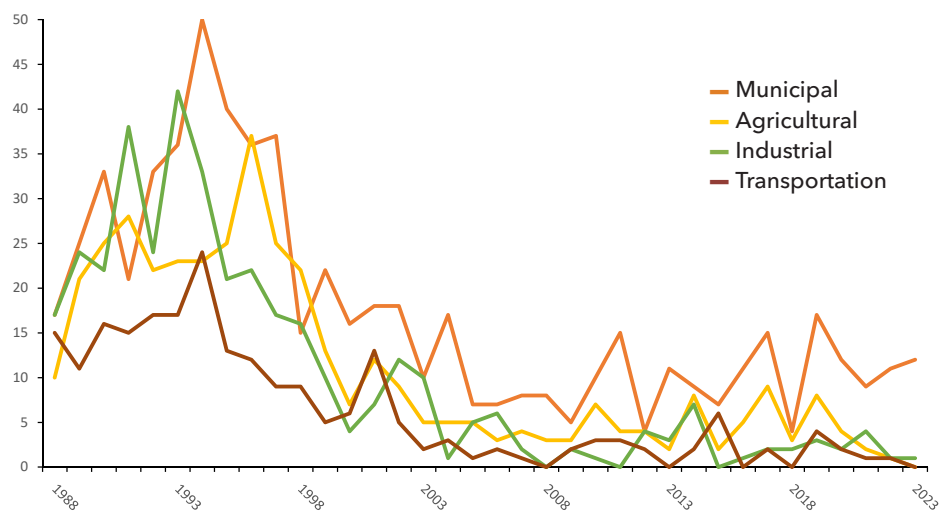
The American Fisheries Society also established methods for calculating recreational losses from pollution-related events. A primary loss from a fish kill is reduced angling until the system recovers, but birdwatching, swimming, and other forms of enjoying nature can also suffer after pollution. Including recreational losses in settlements compensates society for losing these opportunities.

WORKING TOGETHER

DNR was created in 1974 to enforce the Clean Water Act and work to clean up pollution in Missouri. Fish kill and pollution investigations are now a partnership process between both departments. DNR leads investigations, clean ups, remediation of damage caused by pollution, and assesses penalties. MDC supports DNR by leading investigations of fish kills, counting and

Number of Fish Kill Incidents

Computerized records of fish kill investigations began in 1988. After a spike in the 1990s, fish kills have declined. Now, around 30 events are investigated each year.





Fish kill

identifying affected wildlife, and calculating biological value of the damaged resources.

Both agencies have complimentary programs for monitoring plant and animal populations and the environment, providing places for Missourians to enjoy nature, and helping Missourians protect and manage our fish, forest, and wildlife resources.

In the late 1980s and early 1990s, MDC, Conservation Federation of Missouri, and DNR enlisted the help of Missourians by creating the Missouri Stream Team Program. The program educates Missourians about streams and their problems and shows its members how to identify and solve those problems through monitoring, stewardship, and advocacy. A more recent joint effort is an online harmful algal bloom reporting application that allows the public to report suspected algal blooms. Staff from both departments are notified and can investigate.

Missourians value nature and are concerned about water quality and aquatic life. You can help by ensuring that your activities don't release pollutants into Missouri waters. If you notice dead or dying fish, please report them on the MDC fish kill reporting app. Become a Missouri Stream Team Program member and learn how to spot problems and improve conditions in a stream near you. By working together, we can protect our aquatic resources. ▲

MDC Volunteer Programs Manager Rebecca O'Hearn oversees the Missouri Stream Team and Missouri Master Naturalist volunteer programs. Matt Combes is MDC's Ecological Health Unit supervisor.



Algal blooms

Fish Kill and Algal Bloom Reporting Apps

For more information on fish kills, visit short.mdc.mo.gov/Zr6. If you think you have discovered a fish kill, report it. Use the app, located online at short.mdc.mo.gov/4PV.

For information on algal blooms, including how to report, visit short.mdc.mo.gov/4uS.



Missouri Stream Team

Join a Missouri Stream Team and become part of a community of volunteers who focus on the health of Missouri streams. Volunteers on stream teams learn about Missouri's 110,000 miles of flowing water and do hands-on projects such as water quality monitoring,

among other things. The program is a partnership between MDC, the Conservation Federation of Missouri, and the Missouri Department of Natural Resources. For more information, visit mostreamteam.org.

Get Outside

in AUGUST →

Ways to
connect
with nature



Ashy sunflowers



Catch the Red Eye

Red-eyed vireos are one of the few birds that sing on hot, humid summer afternoons. The song, which is helpful for locating this hard-to-see bird, is a monotonous series of two-, three-, or four-syllable whistles, with alternating up- and down-slurred phrases. The call, like that of most vireos, is a burry vray or *tjay*. For more information on the red-eyed vireo, visit short.mdc.mo.gov/4dN.

Let the Sun Shine

Sunflowers are a highlight of late summer. With their bright yellow petals and flattened dark centers, they are reminiscent of the sun itself. There are 16 species of sunflowers, or *Helianthus*, to enjoy in Missouri. Learn more about sunflowers at short.mdc.mo.gov/4dG.

Show-Me Jellyfish

Late summer is a great time to be around the water. If you are near a lake or pond, you may see an aquatic visitor typically seen only in the ocean — a jellyfish. This variety is a freshwater jellyfish that swims when surface water temperatures reach 80 degrees. They will sting like their marine cousins, but it doesn't break the skin. Most people report itching or redness, and some don't feel them at all. To learn more about this aquatic creature, visit short.mdc.mo.gov/4u8.



VIRTUAL

Cooking and Cleaning Fish

Wednesday • Aug. 7 • 12–1:30 p.m.

Online only

Registration required by Aug. 7. To register, call 888-283-0364 or visit short.mdc.mo.gov/4uB.

All ages

Fishing is a great chance to get closer with nature, spend time with family, and feed those close to you. In this virtual program, we will be covering how to clean, prepare, and cook catfish. Join us for a real-time demonstration of how to remove the fillets and cook them both on a stovetop and in the oven.

TREE CRICKET: JULIANNA SCHROEDER; STRIPED BASS: LANCE MERRY

Natural Events to See This Month

Here's what's going on in the natural world.



Yellow-rumped warbler

Fall warbler migration peaks.



Young raccoons are weaned.



Eastern snapping turtle eggs hatch.

VIRTUAL

Getting Ready for Teal Season

Wednesday • Aug. 14 • 1–2 p.m.

Online only

Registration required by Aug 14. To register, call 888-283-0364 or visit short.mdc.mo.gov/4u6.

Ages 12 and older

With teal season starting next month, it's important to be prepared to hunt for one of the fastest waterfowl in Missouri. We'll go over what types of teal you can expect to see and the equipment and decoys that will make your hunt a success.



Blue-winged teal

Sounds of Summer

Tree crickets, or pale bush crickets, are often heard but rarely seen. True to their name, they live in trees, bushes, and tall herbaceous plants at least a foot or so above the ground. Most are delicate, pale green insects. Some members of this group are ones whose calls can be used as thermometers, because their regular, rhythmic chirping becomes slower as the temperature falls.



Peeping for Pawpaws

Did you know Missouri has an official state fruit tree? In 2019, the Missouri Legislature designated the pawpaw as Missouri's state fruit tree. Learn to identify and locate the trees now, so you can watch for the **ripening fruits** in September. Pawpaw trees grow in colonies and resemble large shrubs or small trees with a slender trunk and broad crown. Leaves are 6–12 inches long and flowers are drooping, dark reddish-purple with an odor of fermenting grapes. The sweet fruit can be eaten raw or baked. To learn more about the pawpaw, visit short.mdc.mo.gov/4dp.



Rose gentian blooms.



Striped bass head for cold water.



Be Bearwise

Help bears stay wild and healthy, and keep yourself and your neighbors safe.

HIKING, CAMPING, OR AT HOME

- ▶ Never feed a bear.
- ▶ Always store food and garbage in a secure location.
- ▶ Stay alert and watch for bear signs such as tracks, scat, or claw marks on trees.
- ▶ When hiking, make noise so you don't surprise a bear.
- ▶ Keep dogs leashed when hiking and camping.

IF YOU ENCOUNTER A BEAR

- ▶ Leave it alone! Do not approach it.
- ▶ DO NOT RUN.
- ▶ Back away slowly.
- ▶ Speak in a calm voice.
- ▶ Do not turn your back to the bear.
- ▶ Report all bear sightings to MDC.

Learn more at
Bearwise.org



Places to Go

NORTHWEST REGION

Pony Express Lake Conservation Area

Where doves fly

by Larry Archer

✱ August's heat can keep many folks indoors, but for many of those hearty souls visiting Pony Express Lake Conservation Area (CA), the focus is on their return visits in September.

"People are spending a lot of time out here gearing up for dove season," said Wildlife Biologist Brian Gilbert. "They're really checking out a lot of fields because that's kind of what we're known more for in this part of the state — the dove hunting opportunities."

Located on nearly 3,300 acres in DeKalb County, Pony Express Lake CA includes roughly 100 acres of dove-friendly sunflowers and wheat and a geography that complements the dove population.

"We're on a nice high ridge that gets a lot of dove use," Gilbert said.

Anglers can find fishing opportunities on the area's eponymous lake, as well as three other fishing lakes.

Don't be surprised to see large brush piles, as staff are working to restore grasslands that were overtaken by trees, Gilbert said.

"We're doing a huge push in grassland renovation right now, so hopefully a lot of those grassland obligate birds are going to be cruising the area," he said. "But everything we're taking out, we're either planting native communities back into or using fire to stimulate those native communities."



With boat ramps, a fishing dock, fish cleaning station, and miles of shoreline, the 240-acre Pony Express Lake offers anglers plenty of opportunities for a fun day of fishing. Pony Express Lake CA also has additional fishing spots, ranging from the 44-acre Buffalo Bill Lake to several smaller ponds.

DAVID STONNER



PONY EXPRESS LAKE CONSERVATION AREA

consists of 3,290.1 acres in DeKalb County.
From Cameron, take Hwy. 36 west 6 miles,
then Hwy. 33 north 2 miles, then Rte. RA 1.5
miles to area entrance.

39.7909, -94.3764

short.mdc.mo.gov/4uh 816-675-2205

WHAT TO DO WHEN YOU VISIT



Biking Approximately 12 miles of improved, service, and unimproved roads open to bicycling.



Birdwatching The eBird list of birds recorded at Pony Express Lake CA is available at short.mdc.mo.gov/4ue.



Camping Designated camping sites.



Field Trials Special use permit required.



Fishing Black bass, catfish, crappie, sunfish.



Hunting Deer and turkey
Regulations are subject to annual changes. Refer to MDC's regulation page online at short.mdc.mo.gov/Zjw.

Also **dove, quail, rabbit, and squirrel**



Waterfowl Hunting Open hunting. Closes at 1 p.m. Waterfowl regulations are subject to annual change, so check the *Migratory Bird and Waterfowl Hunting Digest 2024–2025* for current regulations.

WHAT TO LOOK FOR WHEN YOU VISIT



White-tailed deer



Prairie kingsnake



Belted kingfisher



Eastern wood-pewee



Meadow Mushrooms

Agaricus campestris

Status

Choice edible, but with extreme caution

Size

Cap width: 1–4 inches; stalk length: 1–2 inches; stalk width: ¼–¾ inch

Distribution

Statewide



Found in lawns and meadows from July through September, meadow mushrooms have smooth white to light gray caps with pinkish brown gills. The caps are curved to nearly flat, and the texture is dry, smooth, or fibrous. The white, smooth stalks often taper downward and darken with age.



LIFE CYCLE

This species exists most of the time as a network of fungal cells (mycelium) in the soil, digesting and decomposing organic particles. When it's ready to reproduce, the mycelium develops mushrooms, which are aboveground reproductive structures. Because the most active part of the mycelium is along its outer edge, the mushrooms can form in a circular "fairy ring." The mycelium of a mushroom can live for decades.



HUMAN CONNECTIONS

The meadow mushroom is closely related to the cultivated, store-bought white button mushroom. Though meadow mushrooms are edible, it is not advised. They can easily be confused with two other white mushrooms that grow in lawns, green-spored lepiota and destroying angels mushrooms, which are poisonous. For more information, consult *A Guide to Missouri's Edible and Poisonous Mushrooms* at short.mdc.mo.gov/ZNf.

Outdoor Calendar

❖ MISSOURI DEPARTMENT OF CONSERVATION ❖

Free MO Hunting and MO Fishing Apps

MO Hunting makes it easy to view permits, electronically notch them, and Telecheck your harvest. MO Fishing lets you view permits, find great places to fish, and ID your catch. Get both in Android or iPhone platforms at short.mdc.mo.gov/Zi2.



FISHING

Black Bass

Impounded waters and non-Ozark streams:
Open all year

Most streams south of the Missouri River:

- ▶ Catch-and-Keep:
May 25, 2024–Feb. 28, 2025

Bullfrog, Green Frog

June 30 at sunset–Oct. 31, 2024

Nongame Fish Giggling

Impounded waters, sunrise to sunset:
Feb. 16–Sept. 14, 2024

Streams and impounded waters,
sunrise to midnight:
Sept. 15, 2024–Feb. 15, 2025

Paddlefish

On the Mississippi River:
March 15–May 15, 2024
Sept. 15–Dec. 15, 2024

Trout Parks

State trout parks are open seven days a week
March 1 through Oct. 31.

Catch-and-Keep:
March 1–Oct. 31, 2024

Catch-and-Release:
Nov. 8, 2024–Feb. 10, 2025

TRAPPING

Opossum, Raccoon, Striped Skunk

Only foot-enclosing traps and
cage-type traps may be used.

Aug. 1–Oct. 15, 2024

**Only hunters selected through a random drawing
may participate in these hunting seasons.*

For complete information about seasons, limits,
methods, and restrictions, consult the *Wildlife
Code of Missouri* at short.mdc.mo.gov/Zib.
Current hunting, trapping, and fishing regulation
booklets are available from local permit vendors
or online at short.mdc.mo.gov/ZZf.

HUNTING

Black Bear*

Oct. 21–30, 2024

Bullfrog, Green Frog

June 30 at sunset–Oct. 31, 2024

Coyote

Restrictions apply during April, spring turkey
season, and firearms deer season.

Open all year

Crows

Nov. 1, 2024–March 3, 2025

Deer

Archery:
Sept. 15–Nov. 15, 2024
Nov. 27, 2024–Jan. 15, 2025

Firearms:

- ▶ Early Antlerless Portion
(open areas only): Oct. 11–13, 2024
- ▶ Early Youth Portion (ages 6–15):
Nov. 2–3, 2024
- ▶ November Portion:
Nov. 16–26, 2024
- ▶ CWD Portion (open areas only):
Nov. 27–Dec. 1, 2024
- ▶ Late Youth Portion (ages 6–15):
Nov. 29–Dec. 1, 2024
- ▶ Late Antlerless Portion (open areas only):
Dec. 7–15, 2024
- ▶ Alternative Methods Portion:
Dec. 28, 2024–Jan. 7, 2025

Doves

Sept. 1–Nov. 29, 2024

Elk*

Archery:
Oct. 19–27, 2024

Firearms:
Dec. 14–22, 2024

Groundhog (Woodchuck)

May 6–Dec. 15, 2024

Opossum, Raccoon, Striped Skunk

Aug. 1–Oct. 15, 2024

Pheasant

Youth (ages 6–15):
Oct. 26–27, 2024

Regular:
Nov. 1, 2024–Jan. 15, 2025

Quail

Youth (ages 6–15):
Oct. 26–27, 2024

Regular:
Nov. 1, 2024–Jan. 15, 2025

Rabbits

Oct. 1, 2024–Feb. 15, 2025

Sora, Virginia Rail

Sept. 1–Nov. 9, 2024

Squirrels

May 25, 2024–Feb. 15, 2025

Teal

Sept. 7–22, 2024

Turkey

Fall Archery Portion:
Sept. 15–Nov. 15, 2024
Nov. 27, 2024–Jan. 15, 2025

Fall Firearms Portion:
Oct. 1–31, 2024

Waterfowl

See the Migratory Bird and Waterfowl
Hunting Digest or visit short.mdc.mo.gov/ZZx
for more information.

Wilson's (Common) Snipe

Sept. 1–Dec. 16, 2024

Woodcock

Oct. 18–Dec. 1, 2024



**Follow us
on Instagram**

@moconservation

Soak up the scents of native wildflowers before the sun sets on our summer season. Native wildflowers, like these prairie blazing stars at Pawnee Prairie Natural Area in Harrison County, are still in full bloom. Go on a wildflower walk. What will you discover?

📷 by **Noppadol Paothong**

Free to Missouri households

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